SYSTEMS THEORY AND LITERATURE: APPLICATION OF GENERALIZED PHYSICAL SYSTEMS THEORY TO SELECTED LITERARY WORKS *THE TEMPORARY PEOPLE (2017) THE SELL OUT (2015) METAMORPHOSES (1996) THE DISGRACED (2012) GREEN BOOK (2018) LEAVE NO TRACE (2018)*

SYNOPSIS

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The twenty first century world's vision is marked by global knowledge, universalism, and a transdisciplinary perspective. Literary studies have undergone a paradigm shift in the last three decades, with the rise of theories that draw on literary and non-literary fields such as Philosophy, Psychology, Economics, Sociology, and Anthropology, among others. Literary studies have thereby become broader and interdisciplinary.

Literary theory is a systematic investigation into the nature of literature, its functions, and numerous viewpoints and methodologies for analysing literary texts. It is a collection of principles and ideas for analysing literature effectively. In the examination of literary works, it plays a crucial and vital function. Literary criticism arose with the goal of interpreting literature from new and innovative viewpoints, rather than pointing out flaws in a work of art. Literary analysis becomes systematic, scientific, and relevant when diverse methodologies are developed and applied.

Collins English Dictionary defines literary theory as "the systematic analysis and study of literature using general principles."

According to *Cambridge Advanced Learner's Dictionary, "*Literary theory is the formal study and discussion of works of literature." In a broader sense, Literary theory helps a researcher to judge a text and explain its meaning and relevance in the contemporary context. The theories and approaches serve as instruments for revealing the varied underlying meanings of work. New Criticism, Archetypal Criticism, Historical, Biographical Approach, Marxist and Feminist Theories are just a few popular methodologies applied by literary scholars.

Today, literary theories are at the crossroads of all disciplines and draw ideas from many other scholarly fields such as Psychology, Anthropology, Gender Studies, Environment Studies, Linguistics, and others, thus giving rise to "interdisciplinarity". Interdisciplinary approaches involve the combining of two or more academic disciplines, or more specifically, an integration of their methods and concepts, to solve a defined problem.

In recent times, to further expand the scope of literary studies some literary scholars have attempted to relate literature to Systems Science. According to Peter Checkland, the famous Systems scientist, Systems Science is a transdisciplinary discipline.s

The proposed study aims to relate Systems Theory to Literature. Systems Theory is an umbrella term for theories which are based on Systems Thinking and Systems Philosophy. The researchers select a suitable theory in accordance to the purpose of the study and the nature of the system in consideration. The proposed study attempts to apply Generalized Physical Systems Theory (GPST) to selected literary works.

Ludwig von Bertalanffy developed the Systems Theory during the 1950s. He believed that every system is made up of several parts and each constituent part contributes in the development of a system. He focussed primarily on the interactions and on the relationships among parts in order to understand the dependence of every element on the other element. For example, Systems Scientists consider the solar system as a whole and the planets as subsystems. Subsystems interact with one another, and the sum of these interactions is the system's overall function. Bertalanffy, being a biologist, regarded the human body as a system, with diverse organs functioning as subsystems.

Peter Checkland, the renowned Systems Scientist, terms Systems Theory as a meta-discipline and states:

> Systems thinking and Systems Practice differs from other disciplines in the sense that it is a subject which can talk about other subjects. It is not a discipline to be put in the same set as the others. It is a meta- discipline whose subject matter can be applied within virtually any other discipline.

The roots of Systems thinking can be traced back to ancient Vedic and Greek times. Thinkers and philosophers of the East as also of the West believed in an underlying unity in all phenomena, appearances and objects in nature and its creation. However, Systems Science as a transdisciplinary discipline emerged in the second half of the twentieth century with the realization of the scientists that science had become a victim of its own grand reductionist programme. Stephen Toulmins in his famous book *Cosmo Polis: The Hidden Agenda of Modernity (1995)* held Rene Descarte and Isaac Newton as originators of reductionist methodology in science. Rene Descarte, the French philosopher, mathematician and scientist, persuaded his fellow philosophers to renounce fields of study like Ethnography, History, Poetry etc., which are rich in content and context. He also broke with the scholastic-Aristotelian philosophy which emphasised holistic world view and interconnectedness of all beings and objects in the universe. Ludwig von Bertalanffy's efforts in Biology gave birth to a new scientific paradigm which attempted to revive the lost unity of science. He brought back the Aristotelian principle in science- 'the whole is more than the sum of its parts'. Bertalanffy stressed:

> We must strongly emphasize that order or organization of a whole or system, transcending its parts when these are considered in isolation, is nothing metaphysical, not an anthropomorphic superstition or a philosophical speculation; it is a fact of observation encountered whenever we look at a living organism, a social group or even an atom.

The shift from segregation to aggregation in science, acquired greater momentum in the decades after World War ll with the initiatives of cyberneticists like Norbert Weiner and Marin Mazur, mathematicians like Anatol Rapaport, philosophers like Ervin Laszlo, psychologists like Russel L. Ackoff and Fred E. Emery, computer scientists like Gerald M. Weinberg, to name a few who entered the sphere of Systems Science from various specialized disciplines.

Just as one may adopt 'scientific approach' in any discipline, one may adopt 'Systems Approach' in any subject. Though Systems Theory was an offshoot of organismic biology, it soon branched into most of the humanities and other scientific disciplines. Researchers from various disciplines started moving out of their overtly specialized disciplines for collaborative interdisciplinary studies. Their goal was to study how systems of various kinds function, how to deal with complex situations and develop general principles and theories having wider applicability. Christopher Jargodzki (2006) reiterates the importance of holistic approach advocated by the Systems Theory as "emergent and cooperative phenomenon display synergy" i.e., for them the whole is greater than the sum of its parts, as is characteristic of non-linear systems. Much of nature is non-linear including most of what is really interesting in the world. Central to Systems Theory is the concept of 'System'. Peter Checkland (2007) explains the concept of 'system' employed in Systems Theory:

> The central concept 'system' embodies the idea of a set of elements connected together which form a whole, these showing properties which are properties of the whole, rather than properties of its component parts. The taste of water, for example, is a property of the substance water, not of the hydrogen and oxygen which combine to form it.

In a generic sense, systems can be found everywhere in the world; from the solar system to the rail network systems, social systems, natural systems, the internet and the World Wide Web and many more. In fact, the entire universe is one system, made up of several interconnected and interacting parts/elements. Peter Checkland (2007) explicates the types of systems, "In a systems typology, four kinds of systems are there- natural, designed physical, designed abstract and human activity systems".

The concepts of Systems Theory can be applied with equal efficacy even in literature. Within the systems theoretical framework, a literary text becomes a 'literary system', meaning hereby, as a system,

the text and its elements do not exist in isolation, but are related to one another and also to the environment. A poem becomes more than the sum of its words, stylistic and rhetorical devices put together. Piotr Sadowski (1999), the renowned literary theorist who applied Systems theory in literature, explains:

> Like humans with their culture, literature belongs to the middle-sized systems, and it too reveals a hierarchical structure: an individual text can be viewed as a system consisting of interrelated elements such as plot, character, scene, motifs, images and so on, while the text itself can be seen in a larger context as an element of the author's oeuvre, of a literary trend, period and so on.

A literary system is different from a natural and an Engineered system. The proposed study treats literary texts as 'human activity systems'. Peter Checkland explains the major features of human activity systems:

> Human activity systems can manifest only as perceptions by human actors who are free to attribute meaning to what they perceive. There will thus never be a single (testable) account of a human activity system, only a set of possible accounts… Such systems are notional in the sense that they are not descriptions of actual real- world activity but are intellectual constructs; they are ideal types for use in a debate about possible changes which might be introduced into a real –world problem situation.

A literary text is a 'human activity system' because the creation of a literary text is a 'purposeful human activity'. As opposed to Engineered systems, literary systems generate multiple accounts or interpretations with the participation of the readers. They don't present facts, rather present ideas and suggest plausible remedies to various real-world issues. Referring to the application of Systems theory to literature, eminent systems scientist and the founder of Systems Society of India, Rev. Prof. P.S. Satsangi states:

> Literary systems are perceived intuitive systems which belong to the typology of human activity systems rather than other types such as natural systems designed physical or designed abstract systems. Accordingly, they represent soft ill-defined problems or concepts or situations which are complex.

Systems Science offers a variety of transdisciplinary theories which can be applied on a variety of systems in various disciplines. There is an ample choice for scholars to choose an appropriate theory for their study. Some renowned theories include: Interpretive Structural Modelling (ISM), Nominal Group Technique (NGT), Generalized Physical Systems Theory Modelling (GPST), Graph Theoretic Field Modelling (GTFM), Soft Systems Methodology (SSM) etc.

One of the most important developments in Systems Theory is the Generalized Physical Systems Theory Model (GPST Model), which is founded on Topological Graph Theory. Revered Prof. Prem Saran Satsangi, one of the prominent developers of Generalized Physical Systems Theory, explains:

> It enables one to formulate the mathematical or descriptive model of the system in the form of system equations or characteristics for a large variety of linear/non-linear, lumped/distributed parameter, static/dynamic, deterministic/stochastic, crisp/fuzzy, classical/quantum, physical/conceptual, fictional and esoteric systems of consciousness.

The Generalized Physical Systems Theory (GPST) develops on the assumption that whether it is an Electrical, Mechanical, Hydraulic, Managerial or Socio-economic system, its structure can be represented in the form of a Topological Graph. This requires a well-defined system structure, which is true for the Physical Real Systems and also for a class of Physical Conceptual Systems, Managerial and Socio-Economic, and Literary Systems. As Generalized Physical Systems Theory (GPST) is primarily interested in force field modelling, the directed/ oriented graphs are used to represent the structure.

Graphic representation serves as a means of system conceptualization and communication of system structure in Managerial, Socioeconomical, and Literary Systems. Though it demands a transparent structure, its practise helps in clearing the ambiguity and making systems more transparent to the users. Fundamental Axiom of Generalized Physical Systems Theory (GPST) is that, a mathematical model of a component characterizes the behaviour of that component of a system, and shows how the component is interconnected with other components to form a system.

Within the framework of Generalized Physical Systems Theory, the analysis of a system requires the following two postulates:

(1) Component Postulate – Each component of the system under consideration will be mathematically described.

(2) System Structure Postulate – A Mathematical description is given of how the components are combined to form a system. It is further based on the following two concepts:

(a) System Graph Postulate: A system graph is a collection of component terminal graphs obtained by uniting the vertices of the terminal graphs in one-to-one correspondence with the union of the component terminals.

(b) Interconnection Constraint Postulate: The aggregate of these behavioural characteristics is called system characteristics or system behavioural characteristics. The Topological Graph Theory is valuable in the analysis of systems.

The use of graph theoretic consideration in Physical Systems Theory (PST) facilitates the system comprehension, and provides a framework through which the power of graph theoretic tools and techniques can be effectively used for systems modelling and analysis.

The Generalized Physical Systems Theory Model (GPST Model) helps in the formulation of general analytical solutions and in the analysis of various multi-dimensional complex systems including Socio-Economic, Environmental, Literary and Spiritual Systems along with Scientific and Engineered systems. Rev. Prof. Prem Saran Satsangi writes:

> The vast success of Physical Systems Theory as an operational Modelling Methodology is owing to the fact that it is not just based on analysis, but invokes the fundamental properties of measurement or observation (whether quantitative, qualitative fuzzy, emotional, perceptional, intuitive or experiential) for each discipline of its application and is founded on linear graph theory in capturing the structure as a model of interrelationships between the various parts of the whole which is the essence of systems thinking.

The proposed study aims to apply Generalized Physical Systems Theory (GPST) to the following literary works:

1. *Temporary People* (Novel) by Deepak Unnikrishnan (2017)
2. *The Sell Out* (Novel) by Paul Beatty (2015)
3. *Metamorphosis* (Drama) by Marry Zimmerman (1996)
4. *Disgraced* (Drama) by Ayad Akhtar (2012)
5. *Green Book* (2018) (Movie)
6. *Leave no Trace* (2018) (Movie)

Generalized Physical Systems Theory (GPST) is well-known in the fields of Engineering, Science, and Spiritual Systems. It's a ground-breaking effort in the realm of literature. The subjective-descriptive aspect of literary texts would be accommodated by applying Generalized Physical Systems Theory (GPST) to the field of literature. In the proposed study, the "mathematical models" will be substituted with "descriptive models" using basic notions of Topological Graph theory in order to preserve the literary beauty of the works and also for the easy comprehension of literary scholars.

Deepak Unnikrishnan was born in India and moved to Abu Dhabi soon after. He was born in Abu Dhabi and grew up in New Jersey, New York, and Chicago among others. He graduated from the School of Chicago and now teaches at New York University in Abu Dhabi.

In 2004, he released *Coffee Stains in Camel's Teacup*, a collection of short stories. “Foreign Affairs”, “The Guardian”, “Guernica”, “Drunken Boat”, “The Penguin Book of Migration Literature”, and others have published his essays and fiction. Unnikrishnan's novel *Temporary People* is a work of fiction.

Temporary People, a work of fiction about Gulf narratives, is steeped in Malayalee and South Asian dialects. The book presents twenty-eight stories of construction workers who suffer and escape a labour camp. The stories highlight the sufferings and trauma of workers from Gulf.

The book *Temporary People* won the inaugural Restless Books Prize for New Immigrant Writing, the Hindu Prize and the Moore prize. It was also shortlisted for the Believer Book Award, the Crossword Book Award, the DSC Prize for South Asian Literature and the International Dublin Literary Award.

Paul Beatty is an American writer who was born on June 9, 1962 in Los Angeles, California. He graduated from El Camino Real High School in Woodland Hills, California. Beatty acquired MFA degree in creative writing and MA degree in Psychology from Boston University. He is an Associate Professor at the University of Columbia. He is an acclaimed writer who has won awards like the National Book Critics Award (2016) and the Man Booker Prize (2015). He is the first American writer who was honored with the award of Man Booker Prize. His notable works include *The White Boy Shuffle* (1996), *The Sell Out* (2015).

The Sell Out by Beatty portrays the racial relation in United States in the contemporary times. It depicts discrimination and the consequent historical effects of racism in the present times of America. Most of the characters are African- American who face discrimination because of their color.

Mary Zimmerman is a playwright from the United States who was born on August 23, 1960. She earned her bachelor's, master's, and doctorate degrees from Northwestern University in Evanston, Illinois. She was a part of the Lookingglass Theatre's ensemble in Chicago. For her exceptional efforts, she garnered prizes such as the Tony Award for Best Director and the MacArthur Fellowship.

She is best known for her direction of several theatrical adaptations of literary works like *Metamorphoses, Journey to the West, Odyssey, The Arabian Nights and The Notebook of Leonardo da Vinci*.

She directed the play *Metamorphoses* in 2002, which was based on the mythological tales found in Ovid's epic *Metamorphoses*. In both language and picture, the characters in the play, juxtapose the ancient and the contemporary.

Ayad Akhtar is an American playwright and writer who was born on Staten Island, New York, on October 28, 1970. He majored in theatre and religion from Brown University. He travelled to Italy after graduating to serve as an assistant to Jerzy Grotowski. Later, he earned a Master of Fine Arts degree in film directing from Columbia University.

He published his first novel *American Dervish* in 2012. His notable works include *Disgraced (2012), Junk the Golden Age of Debt (2016) and Homeland Elegies (2020)*. He received awards like the Award in Literature, the American Academy of Arts and Letters and the Steinburg Playwright Award for his outstanding contribution in the field of drama.

The play *Disgraced,* which won the Pulitzer Prize for drama, showcases the socio-political themes like Islamophobia and identity crisis of Muslim American citizens. The play starts with a dinner party attended by four people and gradually turns into a solemn discussion meeting. The play highlights the social and ethnic prejudices that are still prevalent in such a progressive community.

Green Book, a movie directed by Peter Farrelly, is based on a true story of a tour of the Deep South by African American classical and jazz pianist Don Shirley and Italian American bouncer Tony Lip, who served as Shirley’s driver and bodyguard. The film was written by Farrelly, Brian Hayes Currie, and Nick Vallelonga. It is named after the mid-twentieth century guide book for African American travellers entitled The Negro Motorist Green Book, written by Victor Hugo Green. The movie premiered at the Toronto International Film Festival on September 11, 2018 and also won People’s Choice Award.

Leave No Trace is an American film, directed by Debra Granik and written by Granik and Anne Rosellini. The movie is based on the novel *My Abandonment* by Peter Rock. It is about military veteran father with post- traumatic stress disorder who lives in the forest with his young daughter. It is based on

a true story. The film premiered at the 2018 Sundance Film Festival and was critically acclaimed. It is the most watched film with an approval rating of 100% on Rotten Tomatoes.

According to the literature review, much work has not been done on Systems Theory and literature. Scientists and engineers have devoted a great deal of time and effort to the study of Systems Theory and its application in their profession, but its use in the field of literature is still in its early stages. In the past two decades literary scholars have been drawn towards Systems Theory.

Some research papers have been published on the relationship between Systems Theory and literature. A research paper entitled "What is Systems Thinking? A Review of Selected Literature Plus Recommendations", was published in *American Journal of Systems Science* (2015) by Jamie P. Monat, Thomas F. Gannon of Worcester Polytechnic Institute, explain the fundamental concepts of Systems thinking and literature.

A research paper entitled "A Brief Review of Systems Theories and Their Managerial Applications" (2010) by Christine Mele, Jaqueline Pels, Francesco Polese highlights the key aspects of Systems Theories and their application in Management and Marketing. It asserts that application of Systems Theory can effectively contribute in the holistic development.

A research paper entitled "On Literature and Systems Theory", was published in an online journal entitled, '*CiteSeer'* (2001), by Florian Crammer examines the relationship between literature and Systems Theory. The writer has explained that how the Systems Theory bridges the gap between Science and Humanities.

In the year 2012, Dr. Bani Dayal Dhir from the Department of English Studies, Dayalbagh Educational Institute, (Deemed to be University) completed her doctoral thesis on the topic *High-End Complexity and Emergentism in Complex Literary Systems*.

Dr. Malvika Gupta submitted her PhD thesis entitled *Systems Theory and Literary Analysis: The Second-Generation Indo-American Fiction of Jhumpa Lahiri, Rishi Reddi and Shauna Singh Baldwin* to the Indian Institute of Technology, New Delhi in the year 2011.

In the year 2020, Chhabi Seth from the Department of English Studies, Dayalbagh Educational Institute, (Deemed to be University) presented her MPhil dissertation, "Applications of Systems Theory in

Literature: A Study with Reference to Selected Works (These Errors Are Correct, Celestial Bodies, Way to Go, Bhoma)".

The selected literary works for the proposed research work have drawn the attention of various research scholars and the research conducted on them is as follows:

M. Subha, Assistant Professor at AMET University Tamil Nadu, has released a research study entitled "Disclosed Ironies in Deepak Unnikrishnan's Temporary People" (2019) in an online library. The sufferings of Gulf migrants are detailed in the research paper. It emphasises terms such as "magical realism," "irony," and "prejudices against black people."

Another research paper entitled "Novel as a Genre of Migration: Reading Temporary People" *(2019)* by Mohamed Shafiq Karinkurayil from Manipal Academy of Higher Education enquires about the influence of these forced migrations on literature.

Scott Astrada from Georgetown University published an article entitled "Home and Dwelling: Re-Examining Race and Identity Through Octavia Butler's Kindred and Paul Beatty's The Sell Out" in September 2017.

Deborah A. Garwood from Drexel University issued a journal entitled "Myth as Public Dream: The Metamorphosis of Mary Zimmerman's Metamorphoses" on *Journal of Performance and Art* in January 2003.

Reuben Mitchell from the Department of Theatre, Morehouse College submitted his thesis *The Role of Hermes ET. AL. in Mary Zimmerman's Metamorphoses a Production Thesis in Acting* in the year 2007.

A Research article entitled "Muslim Identity in twenty first Century America: Ayad Akhtar's work as a Biography" by Saljooq Asif was published on an online library in the year 2015.

Another research article entitled "Exploring the Theme of Neo- Orientalism in Ayad Akhtar's Disgraced" published in *International Journal of English Language, Literature and Translation Studies* by Mona Bagato in 2020.

Though the selected literary works have been explored by researchers from several literary dimensions, the literature review of the selected works reveals that they have not been analyzed and examined from the perspective of Systems Theory.

The literature review reveals that Generalized Physical Systems Theory (GPST) has been employed extensively in the domains of Science and Engineering, but it has not yet been used in the domain of literature. The proposed study is a humble attempt to open up new vistas of research in literature as well as Systems Theory by applying GPST in the field of literature. It is hoped that this initiative will be rewarding in expanding the scope and range of literary studies.

The objectives of the proposed study are as follows:

1. To study the origin, history and development of Systems Theory.
2. To examine the key concepts of Generalized Physical Systems Theory (GPST).
3. To analyse the selected works within the framework of Generalized Physical Systems Theory Modelling.
4. To attempt a stylistic analysis of selected works.
5. To examine the efficacy and the relevance of Systems Theory in literature by comparing it with other prominent theories in literary domain.

In the light of the above-mentioned objectives, the tentative chapter scheme of the proposed study is as follows:

Chapter 1- Introduction

Chapter 2- The Sell Out and Temporary People: A Study with Reference to Generalized Physical Systems Theory

Chapter 3- Metamorphoses and Disgraced: Application of Generalized Physical Systems Theory

Chapter 4- Green Book and Leave no Trace: Application of Generalized Physical Systems Theory

Chapter 5- A Stylistic Study of Selected Literary Works

Chapter 6- Conclusion

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